

## CLAIMS

What is claimed is:

- 5           1. In an internal network comprising a plurality of customer premises equipment (CPE) each having an associated IP address and machine address, a method of routing IP data packets comprising the steps of:
- for IP data packets received from the internal
- 10   network, comparing a destination IP address of a received IP data packet with IP addresses stored in a routing table;
- when said destination IP address matches one of said IP addresses stored in said routing table,
- 15   replacing a default gateway address of said IP data packet with a machine address corresponding with said one IP address from said routing table to create a revised data packet; and
- routing said revised data packet to said internal
- 20   network for receipt another of said CPE, said another CPE having said machine address corresponding with said one IP address.

2. The method as claimed in claim 1 further comprising the steps of:

monitoring IP data packets sent from the plurality of CPE direct to an external communication network to  
5 detect address resolution protocol (ARP) packets sent from each of said CPE;

extracting said machine address and said IP address associated with said each CPE from the ARP packet; and

10 storing said machine address and said IP address in said routing table that correlates machine addresses and IP addresses with each CPE of said plurality.

3. The method as claimed in claim 1 further  
15 comprising the step of routing the IP data packets received from the CPEs to an external network when said destination IP address does not match one of said IP addresses stored in said routing table.

20 4. The method as claimed in claim 3 further comprising the step of routing IP data packets received from the external network directly to the internal network.

25 5. The method as claimed in claim 1 further comprising the step of regularly sending a request data packet to each CPE requesting a response data packet to verify the IP addresses associated with each CPE stored in the routing table.

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6. The method as claimed in claim 2 wherein the monitoring step is performed substantially continually, the extracting step is performed in response to the monitoring step detecting of said ARP packet, and the  
5 storing step is performed when an IP address stored in the routing table differs from an IP address extracted from the ARP packet for a corresponding CPE.

7. The method as claimed in claim 2 further  
10 comprising the step of updating said routing table by performing the monitoring step substantially continuously, performing the extracting step when the monitoring step detects said ARP packet, and performing the storing step when an IP address stored in the  
15 routing table differs from an IP address extracted from the ARP packet for a corresponding CPE.

8. A router for use in an internal network, the internal network comprising a plurality of customer premises devices coupled to the router and a cable modem coupling the router with an external network, the

5 router comprising:

a controller for monitoring IP data packets sent from the plurality of CPE direct to the external communication network to detect address resolution protocol (ARP) packets sent from each of said CPE and  
10 extracting a machine address and an IP address from the ARP packet; and

a memory for storing said machine address and said IP address in a routing table that correlates machine addresses and IP addresses with each CPE of said  
15 plurality,

wherein the controller, for each IP data packet received from each CPE, compares a destination IP address of said IP data packet with the IP addresses stored in said routing table, and when said destination  
20 IP address matches one of said IP addresses stored in said routing table, replaces a default gateway address of said IP data packet with said machine address corresponding with said one IP address from said routing table to create a revised data packet, and  
25 places said revised data packet onto an internal network for receipt by one of said CPE, said one CPE having said machine address corresponding with said one IP address.

9. The router as claimed in claim 8 further comprising first and second interfaces coupled with the controller, the first and second interfaces providing Ethernet connectivity with networks external to said  
5 router, wherein the first interface is coupled to said internal network, and the second interface is coupled to said cable modem for communicating with the external network.

10 10. The router as claimed in claim 9 wherein the controller routes the IP data packets received at the first interface from the CPEs to the external network when said destination IP address does not match one of said IP addresses stored in said routing table.

15 11. The router as claimed in claim 9 wherein the controller routes IP data packets received at the second interface from the external network directly to the first interface for receipt by the internal  
20 network.

12. The router as claimed in claim 9 wherein the controller regularly sends a request data packet to each CPE requesting a response data packet and verifies  
25 the IP addresses associated with each CPE stored in the routing table.

13. The router as claimed in claim 9 wherein the controller updates said routing table when an IP  
30 address stored in the routing table differs from an IP address extracted from the ARP packet for a corresponding CPE.

14. A method of routing IP data packets among a plurality of customer premises equipment (CPE), the method comprising the steps of:

monitoring IP data packets sent from the plurality  
5 of CPE direct to an external communication network to detect address resolution protocol (ARP) packets sent from each of said CPE;

extracting a machine address and an IP address from the ARP packet;

10 storing said machine address and said IP address in a routing table that correlates machine addresses and IP addresses with each CPE of said plurality;

for each IP data packet received from each CPE, comparing a destination IP address of said IP data  
15 packet with the IP addresses stored in said routing table;

when said destination IP address matches one of said IP addresses stored in said routing table, replacing a default gateway address of said IP data  
20 packet with said machine address corresponding with said one IP address from said routing table to create a revised data packet; and

placing said revised data packet onto an internal network for receipt by one of said CPE, said one CPE  
25 having said machine address corresponding with said one IP address.

15. The method as claimed in claim 14 further comprising the step of routing the IP data packets  
30 received from the CPEs to the external network when said destination IP address does not match one of said IP addresses stored in said routing table.

16. The method as claimed in claim 14 further comprising the step of routing IP data packets received from the external network to the internal network.

5        17. The method as claimed in claim 14 further comprising the step of providing each CPE an IP address from an external network server performing a dynamic host configuration protocol (DHCP).

10        18. The method as claimed in claim 15 further comprising the step of regularly sending a request data packet to each CPE requesting a response data packet to verify the IP addresses associated with each CPE stored in the routing table.

15        19. The method as claimed in claim 18 wherein the request data packet is a "ping" generated by a home router.

20        20. The method as claimed in claim 18 wherein the request data packet is a second ARP data packet generated by a home router.

25        21. The method as claimed in claim 14 wherein the monitoring step is performed substantially continually, the extracting step is performed in response to the monitoring step detecting of said ARP packet, and the storing step is performed when an IP address stored in the routing table differs from an IP address extracted  
30        from the ARP packet for a corresponding CPE

22. The method as claimed in claim 14 further comprising the step of updating said routing table by performing the monitoring step substantially continuously, performing the extracting step when the monitoring step detects said ARP packet, and performing the storing step when an IP address stored in the routing table differs from an IP address extracted from the ARP packet for a corresponding CPE.

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